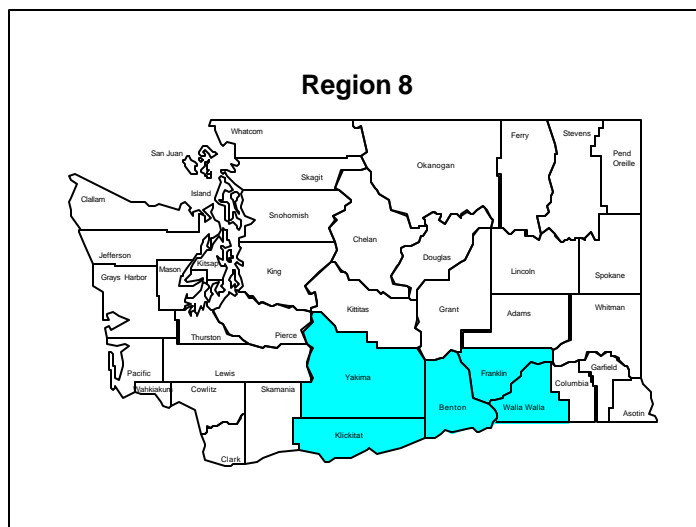


Region 8

Region 8 includes the counties of Benton, Franklin, Kittitas, Walla Walla and Yakima in the south-central section of Washington.

The terrain runs from the crest of the Cascade Mountains in the west to the central valleys and to the foothills of the Blue Mountains in the east. Three major rivers – the Columbia, Snake, and Yakima Rivers – provide much of the water for the region's abundant crops of tree fruits, vegetables and grain.

The region grew about the same rate as the rest of the state during the 1990s. Its population is much more diverse than the state as a whole; Franklin County does not have a majority population; more than half of its residents are from non-white racial and ethnic groups. More than 40 percent of Yakima County's residents are from non-white racial and ethnic groups. People of Hispanic origin make up the bulk of the ethnic population in the region.



Agriculture and affiliated industries, and the U.S. Department of Energy's Hanford Site, provide the base of Region 8's economy. The region's counties are among the most productive farming communities in the nation, growing a variety of tree fruit, vegetables and grain. A significant percentage of the region's workers drive to work in counties other than where they live; more than a third of Franklin County residents, and more than a fifth of Klickitat County residents are commuters.

The Counties

*Benton County*¹

Benton County has an area of 1,703 square miles, ranking it 22nd largest among the 39 counties in the state.

Its population in 2000 was 142,475, making Benton County the 10th most populous county in Washington. Population density is about 85 residents per square mile, making the county the ninth most densely populated county in the state.

Benton County grew more than 26 percent during the 1990s, a rate slightly higher than the state as a whole. Since 1970, the county's population doubled. Three of every five new residents from 1990 to 2000 moved into the county. Eleven percent of the population is people of Hispanic origin.

Region 8

Three of every four people in Benton County live in incorporated areas. Kennewick and Richland, the two largest cities, have 38 and 26 percent of the total county population, respectively.

The terrain generally is basin and valley bottomland with upland plateaus; elevation runs from about 300 feet above sea level to more than 3,000 feet in the higher reaches of the Rattlesnake Hills in western Benton County.

Three rivers dominate Benton County – the Columbia, Snake, and Yakima Rivers. The area of their confluence is near Kennewick and Richland. The Horse Heaven Hills, southwest of the urban area, is where the rivers converge to form Lake Wallula upstream from McNary Dam on the Columbia River. The rivers give this area its most enduring character – abundant water for both irrigation and energy, a major transportation intersection, and a major recreational resource.

The rivers provide a sharp contrast to the surrounding land, the majority of which is either under irrigation or dry land cultivation. In Benton County, 56 percent of the land is under cultivation and 25 percent is irrigated.

Benton County's western boundary is Yakima and Klickitat Counties; its northern boundary is Grant County; and its eastern boundary is Franklin and Walla Walla Counties. The Columbia River, and the state of Oregon, makes up its southern boundary.

Benton County's economy is heavily dependent on operations at the U.S. Department of Energy's Hanford Site as well as on agriculture, food processing, and related industries. Hanford accounts for 22 percent of non-farm employment in Benton County. In comparison, aircraft manufacturing accounts for 7 percent of non-farm employment in King, Snohomish, and Island Counties in the Puget Sound region

Most agriculture jobs involve crop production, with the remainder in rearing livestock or providing agricultural services. Major crops include wheat, potatoes, asparagus, grapes, cherries, apples, and other fruits.

Franklin County²

Franklin County has an area of 1,242 square miles, making it 27th in size.

Its population in 2000 was 49,347, making it the 21st largest in the state. Population density is more than 40 residents per square mile, making Franklin County the 17th most densely populated in the state.

The county grew nearly 32 percent from 1990 to 2000, much faster than the state as a whole. Two out of every three people in Franklin County live in its cities. Pasco is the largest of the county's four cities. Just over a third of the population growth in the 1990s was from people moving into the county.

Region 8

Nearly one-half (about 46 percent) of Franklin County residents are of Hispanic origin. This people group grew by nearly 80 percent from 1990 to 2000.

The terrain of Franklin County is similar to that of Benton County – basin and valley bottomland with upland plateaus. The Columbia and Snake Rivers define its southern borders; counties on its borders are Benton County to the west, Walla Walla County to the east, and Grant, Adams, and Lincoln Counties to the north.

Agriculture defines Franklin County; crops grow on nearly three quarters of its land, with nearly 40 percent under irrigation. Agriculture provides jobs for nearly one of every four workers in the county; in some sectors, it provides the bulk of employment (for example, 92 percent of manufacturing jobs are in food processing).

Franklin County is among the top producers in the nation for potatoes (third), alfalfa hay (seventh), apples (12th), and vegetables (among the top 100), according to the 1997 Census of Agriculture.

*Klickitat County*³

Klickitat County has an area of 1,880 square miles, ranking it 16th in size among Washington's 39 counties.

Its population in 2000 was 19,161; it grew only two-thirds as fast as the state during the 1990s. About two-thirds of its residents live in unincorporated areas of the county. Klickitat County has three cities: Goldendale, White Salmon, and Bingen. The county is one of the least densely populated in the state, with just over 10 residents per square mile.

As in many rural counties with resource-based economies, a significant percentage of the Klickitat County's young adults, age 20 to 34, leave for college or the city and do not return, primarily because of lack of job opportunities. According to the 2000 Census, the percentage of young adults is just two-thirds of the state average.

Klickitat County is the most southerly of the counties that form a plateau extending from the Cascade Range to the Columbia River. The county's has sparsely vegetated hills in the north and rich, fertile valleys in the south. Elevations range from 50 feet above sea level along the shores of the Columbia River to nearly 6,000 feet at Indian Rock north of Goldendale.

A number of rivers and streams flowing from the Cascades carry water to the fertile valleys. Most notable of these tributaries are the White Salmon and Klickitat Rivers in the western section of the county, and Rock and Alder Creeks in the east.

The Columbia River – and the state of Oregon – provide Klickitat County's southern border. Yakima County provides its northern border, Skamania County its western border, and Benton County its eastern border.

Region 8

Agriculture, timber, the Goldendale aluminum smelter, and the Roosevelt waste dump provide the base of Klickitat County's economy. When compared with the rest of the state, the county has a much higher percentage of its work force in agriculture, manufacturing, and transportation and utilities, the industry classification that includes landfills. (Note: In March 2003, operations at the Goldendale smelter were temporarily suspended due to low prices on the international market.)

At the time of the 1997 Census of Agriculture, about half of Klickitat County's land was devoted to agriculture, with much of this land used for pasture or range for livestock. Crops took about 15 percent of the farm acreage; major products include tree fruits – chiefly apples, pears, and cherries – cattle and calves, wheat, hay, dairy products, and a variety of vegetables.

Walla Walla County⁴

Walla Walla County has an area of 1,271 square miles; it ranks 26th in size.

Its population in 2000 was 55,180; the county grew at just two-thirds the rate of the state as a whole during the 1990s. About three quarters of its growth was from people moving into the county. More than half of Walla Walla County's population lives in the city of Walla Walla; College Place, Prescott and Waitsburg are its other cities. About one in six people is of Hispanic origin, and about one in six is 65 years of age or older. More than 43 residents live per square mile, making Walla Walla County the 16th most densely populated in the state.

The county's terrain is diverse. The western part of the county is flat grasslands, while the central part of the county has gentle, rolling hills. The lowest elevations in the county are in the west, where the land descends to 340 feet above sea level at the banks of the Columbia River. The west and central terrains are particularly suitable for a variety of crops. Terrain in the east becomes increasingly steeper as it runs up against the Blue Mountains. Elevations reach 4,540 feet above sea level.

The Walla Walla and Touchet Rivers are the principal rivers in the county. Both originate in the Blue Mountains and flow west across the county before emptying into the Columbia River.

Walla Walla County is bounded to the north by Franklin County along the Snake River, to the west by Benton County along the Columbia River, and to the east by Columbia County. The county's southern boundary forms part of the Washington-Oregon border.

The county has a broad economic base. Its primary economic sectors include agriculture, manufacturing, wholesale trade, higher education, and government. The agricultural sector is large; the county's farms rank first in the state in the production of onions and alfalfa seed, and fourth in the state in the production of wheat. Corn, potatoes, hay, fruits, sweet corn, apples and grapes are important crops. The manufacturing sector is strong; about half its jobs are in food processing.

Region 8

About 40 wineries have located in the Walla Walla Valley in recent years. While the wineries do not directly employ a large number of workers, they are becoming a significant draw for tourists, many of whom travel from western Washington.

*Yakima County*⁵

Yakima County has an area of 4,296 square miles, making it the second largest county in the state.

Its population in 2000 was 222,581 in 2000, ranking it the seventh most populated. More than 52 people live per square mile, making Yakima County the 14th most densely populated in the state.

During the 1990s, the county grew at a rate slightly less than the state as a whole. Two of every five residents is a racial or ethnic minority, with people of Hispanic origin making up a third of the county's population. More than one quarter of the population is under the age of 14.

Three of every five county residents live in a city. The county has 14 incorporated cities, most located on or near the rivers flowing through the county. Yakima is the largest city, followed by Sunnyside and Toppenish. The county also is home to the Confederated Tribes of the Yakama Nation; the tribe's reservation straddles Yakima and Klickitat Counties. More than 4.5 percent of the population of Yakima County is Native American.

The county's terrain varies from mountain peaks to fertile river valleys. Terrain in the west is mountainous, densely timbered, and increasingly elevated as the county nestles against the Cascade Range; Mount Adams is the highest point at 12,307 feet above sea level.

The Yakima River is the life-blood of the valley. The river is a 215-mile tributary of the Columbia River, connecting the two adjacent basins. Water from a number of lakes and smaller rivers in the Cascade foothills feed the Yakima River as it flows into the valley, where it provides water to the productive fields and orchards.

Agriculture's impact in Yakima County's economy is huge. This sector provides more than one of every four jobs in the county, and more than one of every five agriculture jobs in the state. According to the 1997 Census of Agriculture, Yakima County was the 10th most productive county in the nation, and tops in the state; the value of its crops and animals at the farm gate was more than \$873 million. Yakima County was the leading producer in the nation of tree fruit (apples, cherries, pears, etc.); one of the top 100 producers of vegetables; and behind only Grant County in the number of acres planted and irrigated acres in 1997. Manufacturing is another important sector to the county's economy; much of the county's manufacturing base involves food processing and production.

Region 8

Population and Demographics

As shown in Table 1 below, Region 8's population grew at about the same rate as the state during the 1990s. Benton and Franklin Counties grew much faster than the state average, while the other three counties grew more slowly. Growth in the region is expected to be lower than the state average through the year 2025; Franklin and Klickitat Counties are expected to lead the region's growth.

Table 1. Population Growth

	1990 Population	2000 Population	% Change	2025 (Projected)	% Change from 2000
Benton	112,560	142,475	26.5%	184,818	29.7%
Franklin	37,473	49,347	31.7%	68,997	39.8%
Klickitat	16,616	19,161	15.3%	25,855	34.9%
Walla Walla	48,439	55,180	13.9%	67,158	21.7%
Yakima	188,823	222,581	17.9%	283,884	27.5%
Total	403,911	488,744	21.0%	630,712	29.0%
<i>Washington State</i>	<i>4,866,663</i>	<i>5,894,121</i>	<i>21.1%</i>	<i>7,975,471</i>	<i>35.3%</i>

Source: U.S. Census Bureau, Census 2000; *2002 Population Trends*, State of Washington Office of Financial Management, Forecasting Division; *Washington State County Population Projections For Growth Management*, Intermediate Projection, State of Washington Office of Financial Management, Forecasting Division, January 2002.

Much of Region 8's population lives in densely populated areas; about three of every four residents in the region live in or near the Tri-Cities area of Benton and Franklin Counties, the city of Walla Walla, and in the cities of the Yakima Valley. Only Klickitat County has more people living in rural areas than in urban areas. See Table 2, below.

Table 2. Urban/Rural Populations, 2000

	Urban	Rural
Benton	125,322	17,153
Franklin	39,473	9,874
Klickitat	7,943	11,218
Walla Walla	44,744	10,436
Yakima	156,640	63,941
Total	374,122	112,622
Percentage	76.9%	23.1%
<i>Washington State</i>	<i>81.9%</i>	<i>18.1%</i>

Source: U.S. Census Bureau, Census 2000: Population and Housing by Urban Classification.

Region 8

The ability to prepare for and recover from a disaster varies among population groups. Research on various population groups and disasters found that it took some populations longer to recover from a disaster for a variety of reasons. These population groups include minorities, people with language barriers, the disabled, the elderly, and those with low income.

Ethnic Groups

People from non-white population groups generally experience longer recoveries due to lower incomes, savings and insurance; their difficulty accessing insurance; and their using aid and relief organizations differently than was anticipated. Language and cultural differences can pose difficulties in some populations understanding and implementing preparedness and mitigation actions as well as accessing and using available disaster relief.

Table 3, below, shows that Region 8, overall, is much more diverse than the state as a whole. The region has a large Hispanic population; a majority works in the fields and orchards, picking and harvesting fruit and vegetables. Nearly half of Franklin County residents, and one third of the Yakima County residents, are of Hispanic origin. In addition, Klickitat and Yakima Counties have a significant Native American population. The growth rate of most ethnic groups outpaced that of the white population during the 1990s.

Table 3. Population by Ethnic Group

	Hispanic/ Latino	Asian	African American	Native American	Total
Benton	12.5%	2.2%	0.9%	0.8%	16.4%
Franklin	46.7%	1.6%	2.5%	0.7%	51.5%
Klickitat	7.8%	0.7%	0.3%	3.5%	12.3%
Walla Walla	15.7%	1.1%	1.7%	0.8%	19.3%
Yakima	35.9%	1.0%	1.0%	4.5%	42.4%
<i>Washington State</i>	<i>7.5%</i>	<i>5.5%</i>	<i>3.2%</i>	<i>1.6%</i>	<i>17.8%</i>

Source: U.S. Census Bureau, Census 2000.

Region 8's diversity shows in the percentage of people who do not speak English as their primary language at home and who speak English less than very well, as shown in Table 4, below.

Nearly one-half of Franklin County residents speak a language other than English at home, primarily Spanish; a quarter of its residents speak English less than very well. Yakima and Klickitat Counties also have large populations whose primary language is Spanish and who speak English less than very well. This means that a significant percentage of the region's population may have a language barrier that prevents them

Region 8

from preparing for a disaster, responding to an event, or applying for assistance after a disaster.

Table 4. Primary Language Spoken at Home

	Language Other Than English	English Less Than Very Well	Spanish	English Less Than Very Well	Other Indo- European	English Less Than Very Well	Asian- Pacific Islander	English Less Than Very Well
Benton	14.2%	6.4%	10.2%	4.9%	2.5%	0.9%	1.3%	0.6%
Franklin	44.6%	25.2%	41.3%	23.7%	1.6%	0.6%	1.6%	0.9%
Klickitat	10.6%	5.0%	7.7%	4.3%	1.2%	0.4%	0.2%	0.1%
Walla Walla	16.2%	7.8%	13.4%	6.9%	1.4%	0.3%	0.9%	0.4%
Yakima	31.8%	16.2%	29.8%	15.5%	0.9%	0.3%	0.6%	0.3%
WA State	14.0%	6.4%	5.8%	2.8%	3.2%	1.3%	4.4%	2.2%

Source: U.S. Census Bureau, Profile of Selected Social Characteristics: 2000

Disabled People

Community preparedness activities often do not consider the needs of people with disabilities. They have complex challenges because of hearing, sight, mobility, or mental impairments. Additionally, a significant percentage of working-age people with disabilities do not work. These factors make it difficult for the disabled to prepare in advance of a disaster.

Table 5, below, shows that from one in five people to one in four people of working age in Region 8 have a disability that does not require them to be institutionalized. About half have jobs; only Benton and Franklin Counties have populations of working disabled close to the state average; the rest have a lower percentage. Between 40 and 50 percent of retirement age people in the region have a disability

Table 5. Non-Institutionalized Disabled Population

	21 to 64 Years		65 Years and Older
	% of Population	% Employed	% of Population
Benton	17.9%	57.5%	42.3%
Franklin	23.7%	57.1%	42.6%
Klickitat	20.8%	45.7%	50.0%
Walla Walla	20.4%	51.4%	45.8%
Yakima	24.1%	52.6%	48.0%
Washington State	17.7%	57.6%	42.3%

Source: U.S. Census Bureau, Profile of Selected Social Characteristics: 2000.

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Senior Citizens

Preparedness and recovery activities may overlook senior citizens; their age could lead them to have difficulty after a disaster, perhaps not qualify for loans, or become disabled because of the disaster. Table 6, below, shows the counties of Region 8 have populations of retirement age people at about the same percentage as the state as a whole.

Table 6. Population Over Age 65

	% of Total Population
Benton	10.3%
Franklin	8.5%
Klickitat	13.8%
Walla Walla	14.8%
Yakima	11.2%
<i>Washington State</i>	<i>11.2%</i>

Source: U.S. Census Bureau, Census 2000

Poverty

The amount of money people have influences what type of housing they live in, whether they can engage in mitigation actions, and how long it takes to recover. Income is based on a number of factors, including the individual, the economy, availability of jobs, educational opportunity, among others. Expenses can vary by location – rural places are cheaper to live but have fewer jobs, while urban areas can be costly, even for renters.

Table 7, below, shows that all counties but Benton County have a greater percentage of people living in poverty than the state as a whole. Contributing to this is agriculture-based economies with abundant part-time, seasonal and low-paying jobs. Three counties – Franklin, Klickitat, and Yakima – are considered distressed because their unemployment rate has been at least 20 percent higher than the state average for the past several years (most recently, the 2000-2002 period.)

Region 8

Table 7. Poverty Rates

	% of Total Population	Children Under 18	Over Age 65
Benton	10.3%	14.3%	6.9%
Franklin	19.2%	26.0%	7.7%
Klickitat	17.0%	22.5%	15.1%
Walla Walla	15.1%	18.8%	8.2%
Yakima	19.7%	27.2%	11.3%
<i>Washington State</i>	<i>10.6%</i>	<i>13.2%</i>	<i>7.5%</i>

Source: U.S. Census Bureau, Profile of Selected Economic Characteristics: 2000.

School Children

While children overall are captured in figures elsewhere in this profile, the number of children attending school is a concern because many of the school buildings they spend considerable time in each day are older and potentially more vulnerable to the effects of disaster. Table 8, below, shows the population of school-age children in Region 8; it does not show the number that are in potentially vulnerable buildings.

Table 8. School Enrollment – Kindergarten through High School

	Total	Kindergarten	Elementary	High School
Benton	31,831	2,328	19,456	10,047
Franklin	12,379	944	7,683	3,752
Klickitat	4,081	242	2,507	1,332
Walla Walla	10,530	619	6,398	3,513
Yakima	53,034	4,238	32,899	15,897
Total	111,855	8,371	68,943	34,541
<i>Washington State</i>	<i>1,127,448</i>	<i>82,637</i>	<i>697,192</i>	<i>347,619</i>

Source: U.S. Census Bureau, Profile of Selected Social Characteristics: 2000.

Housing

Washington's Growth Management Act encourages local jurisdictions to direct population growth into urban growth areas, where urban services can support growth and higher densities. It also requires communities to incorporate mitigation by protecting critical areas and restricting development in areas such as those that are frequently flooded or subject to geologic hazards. Eliminating or limiting development in hazard-prone areas can reduce vulnerability to hazards and the potential loss of life and injuries and property damage.

Table 9, below, provides a breakdown by county of various housing characteristics.

Region 8

Table 9. Housing Development

	Single-Family	Multi-Family	Mobile Homes	Other
Benton	63.2%	22.6%	13.7%	0.5%
Franklin	59.4%	21.8%	18.4%	0.3%
Klickitat	65.8%	9.6%	23.5%	1.1%
Walla Walla	69.0%	20.0%	10.9%	0.1%
Yakima	67.2%	17.9%	14.6%	0.2%
<i>Washington State</i>	<i>65.4%</i>	<i>25.6%</i>	<i>8.5%</i>	<i>0.5%</i>

Source: U.S. Census Bureau, Profile of Selected Economic Characteristics: 2000.

The year housing was built is important for mitigation. The older a home is, the greater the risk natural disasters pose to it. Homes constructed after 1980 are more likely to withstand damage from hazards such as floods, high winds, snow loads, and earthquake because they were built with modern building codes. Table 10, below, shows the general age of housing in Region 8; it is generally older than the state average.

Table 10. Housing – Year Built

	Pre-1939 – 1959	1960 – 1979	1980 – 2000
Benton	26.0%	41.4%	32.6%
Franklin	29.1%	43.7%	27.2%
Klickitat	35.0%	31.3%	33.6%
Walla Walla	48.3%	29.3%	22.4%
Yakima	37.3%	34.6%	28.0%
<i>Washington State</i>	<i>29.4%</i>	<i>32.7%</i>	<i>37.9%</i>

Source: U.S. Census Bureau, Profile of Housing Characteristics 2000

Household Income

Median household income is an indicator of a region's economic stability. It compares economic areas as a whole, and it generally shows distribution of income among the population. Median household income indicates that point where half of all households have a higher income, and half have a lower income.

Table 11, below, shows that median household income in all counties but Benton County is lower than the state average; Benton County benefits greatly from the high-paying jobs at the Hanford Site. Agriculture plays an important part in the economies of all counties; farming has a significant number of part-time, seasonal and low-paying jobs.

Region 8

Table 11. Median Household Income

County	Year 1999
Benton	\$47,044
Franklin	\$38,991
Klickitat	\$34,267
Walla Walla	\$35,900
Yakima	\$34,828
<i>Washington State</i>	<i>\$44,776</i>

Source: U.S. Census Bureau, Profile of Selected Economic Characteristics: 2000

Benton County's median household income is fourth highest in the state; it is the only Eastern Washington County with a household income higher than the state average. The rest of the counties are in the middle of the pack, ranging from Franklin County, ranked 16th, to Klickitat County, ranked 28th. The state's median household income is highly influenced by the high-paying aerospace and high-tech jobs in Puget Sound.

Employment and Industry

Agriculture, manufacturing and government are the primary sectors of the Region 8 economy. The region includes some of the top farm production counties in the nation. Tree fruit, vegetable and grain production, and affiliated industries such as food processing have the largest number of agriculture and manufacturing jobs in the region. Government also is a major employer, primarily from the U.S. Department of Energy's Hanford Site, state-funded higher education and penal institutions, and federal dams and water reclamation projects.

Below are brief descriptions of the economy and employment in the region's five counties.

Benton County

Benton County's economy is heavily dependent on operations at the U.S. Department of Energy's Hanford Site as well as on agriculture, food processing, and related industries.

Agriculture employs 9 percent of workers in the county, compared to 3 percent statewide. The major industry is crop production, particularly of fruits (melons, grapes, and tree fruits), field crops, vegetables, and grains; tree fruit production provides the bulk of employment in this industry. The majority of agriculture jobs are highly seasonal and a significant number are part-time, they often involve migrant farm workers. The agriculture work force, on average, is paid the least of all major industry sectors.

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Manufacturing accounts for more than 7 percent of jobs in Benton County compared to about 13 percent for the state. Food processing provides half of manufacturing sector employment; while large food processors dominate the industry, many processors are small, specialty firms or smaller vintners. The second largest industry in this sector is chemical and allied products, related to environmental cleanup work at Hanford.

Due to the presence of Hanford, Benton County has a much higher proportion of workers in transportation and public utilities sector than the state as a whole (more than 12 percent in Benton County compared to less than 5 percent in the state).

The services sector is the largest economic sector in Benton County, with more than one in four non-farm jobs, primarily due to engineering and management services at Hanford. These services provide about 40 percent of the sector's jobs. Other major industries in this sector include health services and business services.

The trade sector accounted for about 20 percent of jobs in Benton County. Retail trade industries provided 90 percent of employment, primarily in eating and drinking establishments, but also provided the lowest average wages. The remainder of employment was in wholesale trade.

Government accounts for about 17 percent of the jobs in the county, about the same percentage as the state. Local government makes up 81 percent of government employment; the size of this component of the economy is boosted by employment in Energy Northwest electric energy generating station. The largest portion of local government jobs is in K-12 education. State government's share of jobs in Benton County is just 10 percent of the sector. Hanford employs a fair number of federal workers; the share of federal employment is 9 percent of the sector.

Franklin County

Agriculture is a predominant feature of Franklin County's economy, providing nearly one job in four, compared to just one job in 33 statewide. Major crops include wheat, potatoes, asparagus, grapes, melons, and tree fruits including cherries and apples, and other fruits. Most employment, 83 percent, is in crop production, with the remainder in rearing livestock or providing agricultural services.

About 7 percent of Franklin County jobs are in manufacturing, only about half of the state's 13 percent. Nearly all jobs in this sector, 92 percent, involve food processing. Since 1991, the manufacturing sector in this area has grown nearly 13 percent

The trade sector accounts for about 20 percent of jobs in Franklin County; about two thirds are in retail trade, whose largest industry is eating and drinking establishments. The remaining third of the trade jobs are in wholesale trade, primarily in industries related to food production.

Services is the second largest economic sector in Franklin County behind agriculture; service industries employ about one worker of every five in the county. Health services

Region 8

is the largest industry in Franklin County, with 30 percent of sector employment; business services follows, with about 22 percent of the sector's jobs.

The size of the government sector in Franklin County is about the same as in the rest of the state, with about 17 percent of jobs. Local government comprises 65 percent of government jobs in Franklin County, the largest portion of which are in K-12 education. State government has a larger share of the government sector in Franklin County than neighboring Benton County, primarily due to the state correctional facility in Connell.

Klickitat County

Klickitat County's economic base is tied to agriculture, timber, the Goldendale aluminum smelter, and the Roosevelt waste dump. When compared with the rest of the state, the county has a higher percentage of its work force in agriculture, manufacturing, and transportation and utilities (the industry sector that includes landfills). On the other hand, the county's relative isolation from major metropolitan areas limits the types of economic activity located there.

At the time of the 1997 Census of Agriculture, slightly less than half of the county – about 589,000 acres – was farmland. About 70 percent of the farmland was pasture or rangeland for livestock; about 15 percent of acreage was planted in crops. Major farm products include tree fruits (primarily apples, pears, and cherries), cattle and calves, wheat, hay, dairy products, and a variety of vegetables.

Compared to the rest of the state, Klickitat County has a large concentration of its employment in manufacturing. In 2000, manufacturing employed one of every four workers in the county, compared to one in every eight workers in the state. The size of the sector is due to two industries: lumber and wood products and aluminum production; these industries accounted for close to 90 percent of factory jobs in the county. In recent years, circumstances have not been kind to the smelter – high-energy prices caused it to close temporarily in 2001, and the low price of aluminum in the world market caused the plant to curtail operations again in 2003.

The trade sector accounted for just 13 percent of non-farm jobs in the county, compared to about 19 percent for the state. The reasons for this are many. Like many smaller counties, Klickitat lacks the population to support large retail establishments. The county is not a center for tourism and does not pull in dollars from elsewhere. And, residents can easily avoid the sales tax by driving across the Columbia River to shop in Oregon at The Dalles or Hood River. Local employment is concentrated in eating and drinking establishments.

The services sector encompasses industries as diverse as health care, auto repair, hotels, and legal services. The chief industries in this sector are health care and social services. However, the closure of a nursing care facility in Goldendale in 2001 roughly halved health care employment.

Region 8

The largest employer in Klickitat County is government. It employed 30 percent of all non-farm workers in 2000. About 80 percent of all jobs are in local government, compared to about 58 percent statewide. The primary difference is public ownership of the hospitals and the electrical utility.

Walla Walla County

Walla Walla County's economic base is broad, but its backbone is farming and manufacturing related to farm products.

The county's agricultural sector is large, providing more than 11 percent of jobs in 1999, compared to more than 3 percent for the state as a whole. Walla Walla County's farms rank first in the state in the production of onions and alfalfa seed, and fourth in the state in the production of wheat. Corn for grain, potatoes, hay, fruits, and sweet corn are also major crops. The big agricultural employer for the county is cultivation and harvesting of fruits such as apples and grapes; apples are the dominant crop.

Walla Walla County is a regional hub for manufacturing, with more than 17 percent of the county's jobs, roughly half of which are in food processing. The county is home to the state's largest beef packing plant. Production of paper and corrugated fiber containers provides significant employment. Other manufactured goods include lumber and wood products, fabricated and plastic products, and heating equipment. Added to the manufacturing base in recent years are a number of wineries; while they do not directly employ a large number of workers, they are becoming a significant draw for tourists, many from the west side of the state.

The number of jobs in the services sector has more than doubled since 1970. It is the largest employing sector in the county, with 29 percent of non-farm jobs. Health services is the largest employer, with private education being second; the county is home to two provide colleges, Walla Walla College and Whitman College.

The county's trade sector, providing employment to nearly one out of every five non-farm workers, is the second largest sector following services. About 20 percent of trade workers are in wholesale trade, primarily related to movement of locally grown produce to market. In retail trade, with 80 percent of the sector's jobs, restaurants and grocery stores are the major employers.

Government makes up the second largest source of employment in the county following services, with 23 percent of all non-farm jobs, about 5 percent higher than the state average. The reason for the difference is the location of major government agencies in the county, including the Army Corp of Engineers, the Veterans Hospital, the State Prison, and Walla Walla Community College.

Yakima County

As with other counties in this region, agriculture is the foundation for Yakima County's economy. Agriculture's impact on the county's economy is evident – it accounted for

Region 8

more than one of every four jobs in the county, and 22 percent of all farming employment in the state in 2000. According to the 1997 Census of Agriculture, the market value of all farm products was more than \$873 million, ranking the county the 10th most productive in the nation. In 1997, Yakima County was seventh in the production of all fruits, nuts and berries; it was the top producer of apples, second in cherries and pears, 10th in grapes and 15th in plums and prunes. In the late 1990s and early 2000s, international competition and overproduction put a squeeze on many local farms.

Yakima County's manufacturing sector grew nearly 2 percent annually from 1970 to 2000, more than 50 percent faster than the state as a whole. The sector accounts for just fewer than 16 percent of non-farm jobs in the county. Significant employment in the manufacturing sector is in food production – the canning, freezing, and preserving of fresh food products grown locally.

Employment in the trade sector doubled from 1970 to 2000, but this growth was just two-thirds of the state average. This sector provides about one of every four non-farm jobs in the county. Fresh fruit and vegetable packing, storage, trading and transport provided much of the wholesale trade employment. Retail trade has been hurt in recent years due to major retailers providing general merchandise and apparel moving out of Yakima.

Yakima County's services sector tripled in size from 1970 to 2000, but as with the trade sector, did not grow as fast as the state as a whole. The services sector provides about 28 percent of the non-farm jobs in the county. Health care, business and personal services industries expanded their payrolls in 2000.

The government sector provided less than one of every five non-farm jobs in Yakima County in 2000.

Commuting Patterns^{6, 7}

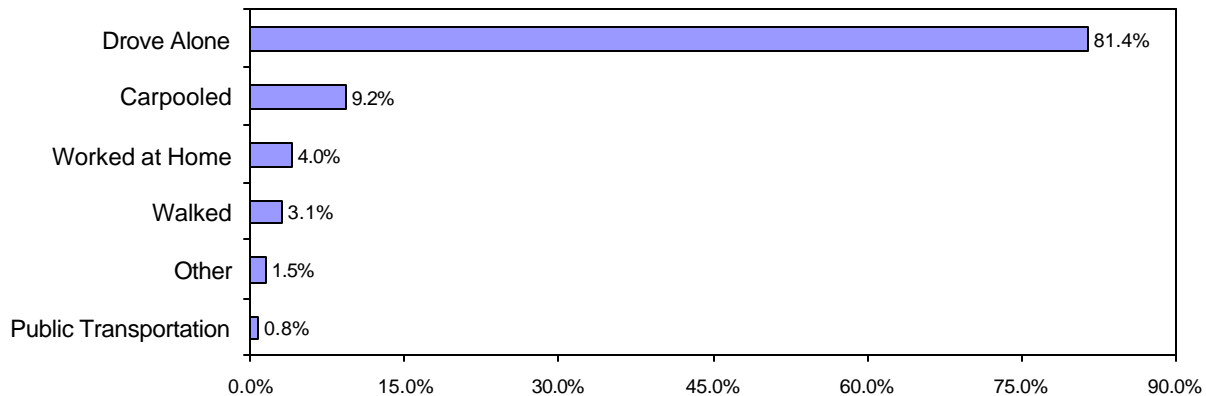
Recent population growth has resulted in a significant increase in workers, automobiles and trucks on the roads. A higher percentage of workers driving alone can cause traffic congestion and accidents. More traffic places a larger load on the region's transportation infrastructure. The impact of an emergency can disrupt automobile traffic, shut down transit systems, and make evacuations more difficult.

A significant percentage of the workers in four counties commute outside their county of residence to jobs. More than one of every three workers in Franklin County commutes to jobs, primarily in Benton County. More than one in four workers in Klickitat County drives to work elsewhere, primarily across the Columbia River to The Dalles and Hood River, OR. About one of every six workers in Benton County commutes, primarily to Franklin County. And just more than one in 10 Walla Walla County workers leaves the county for jobs, primarily to Umatilla County, OR, and to neighboring Benton, Franklin and Columbia Counties.

Region 8

Figure 1, below, shows transportation used by commuters. Primary mode of transportation is driving alone. Public transportation systems carried about 4.25 million passengers in Benton, Franklin, Walla Walla and Yakima Counties in 2001. Vanpools carried another 548,000 passengers in Benton, Franklin, and Yakima Counties.

Figure 1. Commuting Patterns



Source: U.S. Census Bureau, Profile of Selected Economic Characteristics: 2000

Hazards and State Facilities Potentially At-Risk

The regional hazard profiles were developed using information from the individual hazard profiles that are part of the Risk Assessment, as well as from reference documents listed at the end of each hazard profile.

Unless otherwise noted below, at-risk facilities were identified by state agencies participating in this plan using methodology identified in the Risk Assessment Introduction, Tab 7.

Figures for the number of staff/visitors/residents for each at risk facility were calculated on the highest use for that facility; for many structures, this inflates the number of individuals in the buildings at any one time.

The Washington Department of Transportation identified essential transportation corridors, or highways and ferry routes of greatest importance to transportation of people and goods and services.

Region 8

Hazard: Avalanche

Characteristics	Most Vulnerable Areas	Event History	Probability
<p>Avalanches occur when a layer of snow loses its grip on a slope and slides downhill. They occur frequently in the backcountry of the Cascade Range, often without any impact to people, transportation routes or development.</p> <p>Most avalanches that cause injuries or deaths occur outside developed recreation areas; the primary cause of these avalanches is the weight of the victim or someone in the victim's party on the slab of snow. Very few avalanche fatalities occur in on open runs in ski areas or on highways.</p> <p>Avalanche season begins in November and runs through early summer for all mountain areas of the state; in high alpine areas of the Cascade Range, the season is year-round.</p>	<ol style="list-style-type: none">1. Recreation areas in the Cascade Mountains.2. Chinook Pass, State Route 410 (closed to traffic in winter).3. White Pass, U.S. Highway 12.	<p>No reports available on avalanches that have taken place in Region 8.</p>	<p>On average, avalanches kill one to two people every year in Washington State.</p>

Region 8

Hazard: Avalanche		At Risk Population: Unknown of 488,744		PRELIMINARY ASSESSMENT	
State Agency Structures At Risk Number and Function of Buildings		No. of Affected Staff / Visitors / Residents	Approx. Value of Owned Structures	Approx. Value of Contents All Buildings	
<u>Total at-risk buildings</u> : Two state highways, no buildings.		0	0	0	
<u>Function of at-risk buildings</u> : Two state highways are potentially at risk to avalanche:					
1. U.S. Highway 12 at White Pass.					
2. State Route 410 at Chinook Pass. The highway is closed every winter but it experiences residual avalanche problems in the spring after it is reopened.					
<u>Total at-risk critical facilities</u> : One state highway, no buildings.					
<u>Function of at-risk critical facilities</u> : One state highway considered an emphasis corridor because of its importance to movement of people and freight is potentially at risk to avalanche:					
1. U.S. Highway 12 at White Pass.					

Region 8

Hazard: Drought

Characteristics	Principal Sources	Event History	Probability
<p>Drought is a prolonged period of dryness severe enough to reduce soil moisture, water and snow levels below the minimum necessary for sustaining plant, animal, and economic systems.</p> <p>Drought can have a widespread impact on the environment and the economy, depending upon its severity, although it typically does not result in loss of life or damage to property, as do other natural disasters.</p> <p>In Region 8, drought conditions can reduce water available for irrigated crops and domestic and industrial use, as well as affect the availability and cost of power for local industries.</p>	<p>Drought is the result of many causes, often synergistic in nature; these include global weather patterns that produce persistent, upper-level high-pressure systems along the West Coast with warm, dry air resulting in less precipitation.</p>	<p>During 1895-1995, much of the state was in severe or extreme drought at least 5 percent of the time. Region 8 was in severe or extreme drought from 10 to 15 percent of the time during this period.</p> <p>1977 Drought – This region experienced severe or extreme drought conditions from 30 percent to 40 percent of the time during this event.</p> <p>2001 Drought – At the height of the event in this region in August 2001, much of this region experienced moderate drought conditions.</p>	<p>In temperate regions of the world, including Washington state, current long-range forecasts of drought have limited reliability. Meteorologists do not believe that reliable forecasts are attainable any more than a season in advance.</p> <p>Drought conditions of at least moderate severity occur every few years in Washington.</p> <p>On a long-term basis, Region 8 experiences drought conditions of at least moderate severity from 10 to 15 percent of the time.</p>

Region 8

Hazard: Drought

At Risk Population: Unknown of 488,744

PRELIMINARY ASSESSMENT

State Agency Structures At Risk Number and Function of Buildings	No. of Affected Staff / Visitors / Residents	Approx. Value of Owned Structures	Approx. Value of Contents All Buildings
<u>Total at-risk buildings:</u> State Agency identified – 82 (19 owned, 63 leased)	3,935	\$46,359,848	\$48,778,499
<u>Function of at-risk buildings:</u> Included are facilities that potentially could be affected by the secondary impacts of drought (water and electricity shortages, etc.) such as the campus of the Yakima Valley School for mentally and physically disabled adults, and about 75 facilities serving individuals and families on public assistance, providing employment and training services, driver licensing, and liquor sales.			
<u>Total at-risk critical facilities:</u> State Agency identified – 28 (all owned)	1,456	\$25,000,000	39,000,000
<u>Function of at-risk critical facilities:</u> Included are buildings on the campus of the Yakima Valley School for mentally and physically disabled adults.			

Region 8

Hazard: Earthquake

Characteristics	Principal Sources	Event History	Probability
<p>In general, Seismic Hazard Areas in Region 8 are found in:</p> <p>Floodplains and the adjacent bluffs in the Columbia, Naches, Snake, Touchet, Walla Walla and Yakima River valleys because of their high or medium susceptibility to liquefaction and other ground failures.</p> <p>Shorelines of large lakes because of their susceptibility to landslides and other ground failures and to landslide-caused tsunamis.</p>	<ol style="list-style-type: none"> 1. Interplate earthquake in the offshore Cascadia Subduction Zone. Evidence of quakes with magnitude greater than 8 have been found along the Washington coast; the most recent event was about 1700. 2. Shallow, crustal earthquake in the North America (continental) plate. Information is limited on surface faults in Region 8. A fault near Walla Walla generated a magnitude 6.1 earthquake (see right). The Toppenish Ridge fault appears to have been the source of two earthquakes of magnitude 6.5 to 7.3 in the past 10,000 years. 3. Deep, Benioff zone earthquake within the Juan de Fuca plate. This is the source for the 1949, 1965, and 2001 earthquakes. 	<p>1936 – The State-Line earthquake was widely felt throughout the Pacific Northwest. It caused damage in the Walla Walla area, sparsely populated at the time.</p> <p>Since 1970, one earthquake of magnitude 4.0 or greater whose epicenter was in Region 8 occurred in 1998 (M4.0)</p> <p>Region 8 was part of the Presidential Disaster Declaration for the M6.8 Nisqually earthquake in 2001.</p>	<p>Approximate recurrence rate for a magnitude 9 earthquake in the Cascadia Subduction Zone is once every 350 to 500 years.</p> <p>Approximate recurrence rate for earthquakes similar to the 1965 magnitude 6.5 Seattle-Tacoma and 2001 magnitude 6.8 Nisqually events is once every 35 years.</p> <p>Approximate recurrence rate for earthquakes similar to the 1949 magnitude 7.1 Olympia event is once every 110 years.</p> <p>Geologists have uncovered evidence of a number of surface faults in Eastern Washington, including the Toppenish Ridge fault, but have not yet determined how often they generate earthquakes, their magnitude, and the risk they pose to the public.</p>

Region 8

Hazard: Earthquake

At Risk Population: Unknown of 488,744

PRELIMINARY ASSESSMENT

State Agency Structures At Risk Number and Function of Buildings	No. of Affected Staff / Visitors / Residents	Approx. Value of Owned Structures	Approx. Value of Contents All Buildings
<u>Total at-risk buildings:</u> State Agency identified – 128 (43 owned, 85 leased)	4,574	\$50,322,765	\$60,227,473

Function of at-risk buildings: Included are:

- Campus of Yakima Valley School for mentally and physically disabled adults.
- Local detachments, highway weigh scales, crime lab, and communication facilities of the Washington State Patrol.
- About 75 general office and client services facilities serving individuals and families on public assistance, providing employment and training services, driver licensing, and liquor sales.

Six state highways considered emphasis corridors because of their importance to the movement of people and freight are potentially at risk to earthquake:

- | | | |
|---------------------|--------------------|--------------------|
| 1. Interstate 82 | 2. U.S. Highway 12 | 3. U.S. Highway 97 |
| 4. U.S. Highway 395 | 5. State Route 14 | 6. State Route 17 |

<u>Total at-risk critical facilities:</u> State Agency identified – 56 (owned-leased split not available)	1,804	\$31,846,810	\$47,814,938
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Function of at-risk critical facilities: Included are:

- Buildings on the campus of Yakima Valley School for mentally and physically disabled adults.
- Local detachments, highway weigh scales, crime lab, and communication facilities of the Washington State Patrol.
- General office and client services facilities serving individuals and families on public assistance, providing employment and training services, driver licensing, and liquor sales.

Six state highways considered emphasis corridors because of their importance to the movement of people and freight are potentially at risk to earthquake:

- | | | |
|---------------------|--------------------|--------------------|
| 1. Interstate 82 | 2. U.S. Highway 12 | 3. U.S. Highway 97 |
| 4. U.S. Highway 395 | 5. State Route 14 | 6. State Route 17 |

Region 8

Hazard: Flood

Characteristics	Principal Flood Sources	Event History	Probability
<p>Region 8 is subject flooding that occurs on the region's major river systems (see right) as well as flash flooding.</p> <p>Because of their origins in upper elevations, these rivers are influenced by snow and rain patterns in the Cascade Mountains, as well as thunderstorms that cause flash flooding on both frozen and dry ground.</p> <p>Primary flood season is during spring runoff in May and June, although riverine floods can occur during winter months. Flash flooding can occur throughout the year.</p>	<ol style="list-style-type: none"> 1. Columbia River 2. Naches River 3. Snake River 4. Touchet River 5. Walla Walla River 6. Yakima River 	<p>Flooding in Region 8 is a common event. Since 1956, flooding resulted in Presidential Disaster Declarations in 1956, 1964, 1971, 1974, 1975, 1977, 1990 (two disasters), 1995, and 1996.</p> <p>Since 1989, more than \$26.4 million in Stafford Act disaster assistance has been provided to Region 8 for repairs to public facilities following flood events.</p>	<p>The region's major rivers typically flood every two to five years, but damaging flood events occur less frequently.</p> <p>Since 1956, this region has experienced serious flooding resulting in major damage and a Presidential Disaster Declaration about every five years.</p> <p>Only about 2 percent of the area of Region 8 is within the 100-year floodplain.</p>

Region 8

Hazard: Flood **At Risk Population:** Unknown of 488,744 **PRELIMINARY ASSESSMENT**

State Agency Structures At Risk Number and Function of Buildings	No. of Affected Staff / Visitors / Residents	Approx. Value of Owned Structures	Approx. Value of Contents All Buildings
<u>Total at-risk buildings:</u> State Agency identified – 36 (2 owned, 34 leased)	2,090	\$9,196,308	\$13, 036,705

Function of at-risk buildings: Included are general office and client services facilities serving individuals and families on public assistance, providing employment and training services, driver licensing, and liquor sales.

Six state highways considered emphasis corridors because of their importance to the movement of people and freight are potentially at risk to flood where they cross or run through floodplains:

- | | | |
|---------------------|--------------------|--------------------|
| 1. Interstate 82 | 2. U.S. Highway 12 | 3. U.S. Highway 97 |
| 4. U.S. Highway 395 | 5. State Route 14 | 6. State Route 17 |

<u>Total at-risk critical facilities:</u> State Agency identified – 14 (all leased)	815	0	\$7,753,239
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Function of at-risk critical facilities: Included are general office and client services facilities.

Six state highways considered emphasis corridors because of their importance to the movement of people and freight are potentially at risk to flood where they cross or run through floodplains:

- | | | |
|---------------------|--------------------|--------------------|
| 1. Interstate 82 | 2. U.S. Highway 12 | 3. U.S. Highway 97 |
| 4. U.S. Highway 395 | 5. State Route 14 | 6. State Route 17 |

Region 8

Hazard: Landslide

Characteristics	Principal Sources	Event History	Probability
<p>Region 8 is part of two landslide provinces.</p> <p>Cascade Range province – South of Snoqualmie Pass, mountain peaks are lower and consist of predominantly volcanic rock; earth flows and block slides in bedrock are the most common types of landslides in this area.</p> <p>Columbia Plateau province – This landslide province has extensive layers of sediments between, intermingling with, and overlaying basalt flows. Landslides in this province include slope failures in bedrock and landslides in overlying sediments. Irrigation compounds the province's landslide problems.</p>	<ol style="list-style-type: none"> 1. Bluffs along shorelines of river valleys and large lakes. 2. Slopes of the Cascade range. 	<p>1996 – The highest concentration of landslides in the February Storms and Landslides Disaster occurred at the northwest edge of the Blue Mountains near Walla Walla. The main areas affected were the Mill Creek, Blue Creek, Touchet, Tucannon, and Walla Walla drainages. Debris flows were most numerous on open, grassy hillsides. In the Mill Creek area, debris flows destroyed seven vehicles and five homes.</p> <p>Similar occurrences of flooding and landslides took place in 1931 and 1964.</p>	<p>Ground failures that result in landslides have a number of contributing factors that do not allow for the development of a reasonable estimate probability of future events.</p> <p>Factors that contribute to ground failure and landslides include:</p> <ul style="list-style-type: none"> • Local topography. • Erosion on slopes. • Saturation of slopes. • Earthquakes. • Volcanic deposits and debris flows. • Excess weight on weak slopes. • Human action that disturbs slopes.

Region 8

Hazard: Landslide **At Risk Population:** Unknown of 488,744 **PRELIMINARY ASSESSMENT**

State Agency Structures At Risk Number and Function of Buildings	No. of Affected Staff / Visitors / Residents	Approx. Value of Owned Structures	Approx. Value of Contents All Buildings
<u>Total at-risk buildings:</u> State Agencies identified – 25 (one owned, 24 leased)	1,323	\$3,436,840	\$13,452,840

Function of at-risk buildings: Included are general office and client services facilities serving individuals and families on public assistance, providing employment and training services, driver licensing, and liquor sales.

Six state highways considered emphasis corridors because of their importance to the movement of people and freight are potentially at risk to landslide where they cross steep slopes:

- | | | |
|---------------------|--------------------|--------------------|
| 1. Interstate 82 | 2. U.S. Highway 12 | 3. U.S. Highway 97 |
| 4. U.S. Highway 395 | 5. State Route 14 | 6. State Route 17 |

<u>Total at-risk critical facilities:</u> State Agency identified – 13 (all leased)	931	0	\$8,000,000
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Function of at-risk critical facilities: Included are general office and client services facilities.

Six state highways considered emphasis corridors because of their importance to the movement of people and freight are potentially at risk to landslide where they cross steep slopes:

- | | | |
|---------------------|--------------------|--------------------|
| 1. Interstate 82 | 2. U.S. Highway 12 | 3. U.S. Highway 97 |
| 4. U.S. Highway 395 | 5. State Route 14 | 6. State Route 17 |

Region 8

Hazard: Severe Storm

Characteristics	Principal Sources	Event History	Probability
<p>A severe storm is an atmospheric disturbance that results in one or more of the following phenomena: strong winds and large hail, thunderstorms, tornados, rain, snow, or other mixed precipitation. Most storms move into Washington from the Pacific Ocean.</p> <p>Typically, major impacts from a severe storm are to transportation and loss of utilities.</p>	<ol style="list-style-type: none"> 1. High winds 2. Winter storm 3. Blizzard 4. Dust storm 5. Severe thunderstorm 6. Tornado 	<p>Severe storm in Region 8 is a common event. Since 1956, severe storm events resulted in Presidential Disaster Declarations in 1974, 1975, 1977, 1990 (two disasters), 1995, and 1996.</p> <p>Since 1989, Region 8 received more than \$3.3 million in Stafford Act disaster assistance for repairs to public facilities following severe storm events. Yakima County received about 44 percent of the assistance, with the remaining counties dividing the rest.</p>	<p>Projected recurrence rates for the severe storm events to which Region 8 is most vulnerable are as follows:</p> <ul style="list-style-type: none"> • High wind events occur at least once a year in Benton and Yakima Counties. • Winter storms occur about once a year in Walla Walla and Yakima Counties. • Blizzards occur in Walla Walla County; a recurrence rate is not available. • Dust Storms occur about once every four years in the region. • Severe Thunderstorms occur about once every three years in Benton, Walla Walla and Yakima Counties. • Tornados occur about once every 10 years in Walla Walla and Yakima Counties and once every 20 years in Franklin County.

Region 8

Hazard: Severe Storm

At Risk Population: Unknown of 488,744

PRELIMINARY ASSESSMENT

State Agency Structures At Risk Number and Function of Buildings	No. of Affected Staff / Visitors / Residents	Approx. Value of Owned Structures	Approx. Value of Contents All Buildings
<u>Total at-risk buildings:</u> State Agency identified – 123 (39 owned, 84 leased)	4,221	\$53,829,363	\$62,099,650

Function of at-risk buildings: Included are:

- Campus of Yakima Valley School for mentally and physically disabled adults.
- Local detachments, highway weigh scales, crime lab, and communication facilities of the Washington State Patrol.
- About 70 general office and client services facilities serving individuals and families on public assistance, providing employment and training services, driver licensing, and liquor sales.

<u>Total at-risk critical facilities:</u> State Agency identified – 36 (owned-leased split not available)	1,907	\$31,846,810	\$15,682,759
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Function of at-risk critical facilities: Included are:

- Buildings on the campus of Yakima Valley School for mentally and physically disabled adults.
- Local detachments, highway weigh scales, crime lab, and communication facilities of the Washington State Patrol.
- General office and client services facilities serving individuals and families on public assistance, providing employment and training services, driver licensing, and liquor sales.

Region 8

Hazard: Tsunami

Characteristics	Principal Sources	Event History	Probability
<p>A tsunami resembles a series of quickly rising tides that withdraw with currents much like those of a river. Swift currents commonly cause most of the damage. A Pacific Ocean tsunami can affect the entire Pacific basin, while a tsunami in inland waters can affect many miles of shoreline.</p> <p>Tsunamis typically cause the most severe damage and casualties near their source. Waves are highest there because they have not yet lost much energy.</p> <p>Another class of damaging water wave is a seiche. A seiche is a wave generated in a body of water from the passage of seismic waves caused by earthquakes. Sedimentary basins beneath the body of water can amplify a seismic seiche and the natural sloshing action in a body of water or focus water waves onto a section of shoreline.</p>	<p>Tsunamis and seiches can be generated by a number of sources:</p> <ol style="list-style-type: none"> 1. Distant earthquakes along the Pacific Rim (i.e., 1964 Alaska earthquake). 2. Local earthquakes, such as those generated by local surface faults; in the Benioff zone; or in the Cascadia Subduction Zone off the coast. 3. Large landslides into bodies of water 4. Submarine landslides in bodies of water. 	<p>None recorded.</p>	<p>Geologists have uncovered evidence of a number of surface faults in Eastern Washington, but have not yet determined how often they generate earthquakes, their magnitude, and whether they could generate a tsunami or seiche in an enclosed body of water in Region 8.</p> <p>Approximate recurrence rate for a magnitude 9 earthquake in the Cascadia Subduction Zone is once every 350 to 500 years.</p> <p>Approximate recurrence rate for the quakes similar to the 1965 magnitude 6.5 Seattle-Tacoma and 2001 magnitude 6.8 Nisqually quake is once every 35 years.</p> <p>Approximate recurrence rate for the 1949 magnitude 7.1 Olympia earthquake is once every 110 years.</p>

Region 8

Hazard: Tsunami

At Risk Population: Unknown of 488,744

PRELIMINARY ASSESSMENT

State Agency Structures At Risk Number and Function of Buildings	No. of Affected Staff / Visitors / Residents	Approx. Value of Owned Structures	Approx. Value of Contents All Buildings
<u>Total at-risk buildings:</u> No state facilities.	0	0	0
<u>Total at-risk critical facilities:</u> No state facilities.	0	0	0

Region 8

Hazard: Volcano

Characteristics	Volcanoes in Region	Event History	Probability
<p>Region 8 is home to Mount Adams.</p> <p>Volcanoes can lie dormant for centuries between eruptions. When Cascades volcanoes do erupt, high-speed avalanches of hot ash and rock called pyroclastic flows, lava flows, and landslides can devastate areas 10 or more miles away, while huge mudflows of volcanic ash and debris called lahars can inundate valleys more than 50 miles downstream. Falling ash from explosive eruptions can disrupt human activities hundreds of miles downwind, and drifting clouds of fine ash can cause severe damage to the engines of jet aircraft hundreds or thousands of miles away.</p> <p>Much of Mount Adams' hazard area for eruptive events lies in the Gifford Pinchot National Forest or remote areas of the Yakima Indian Reservation. Areas of greatest concern are located along the channels and floodplains of rivers subject to lahars.</p> <p>The region also can be affected by ash fall from the rest of the state's volcanoes.</p>	<p>1. Mount Adams</p>	<p>Mount Adams in Yakima County has produced few eruptions during the past several thousand years. Its most recent activity was a series of small eruptions about 1,000 years ago.</p> <p>The Trout Lake lahar, which occurred about 6,000 years ago, is the only lahar that traveled far (35 miles) beyond the volcano flanks in the past 10,000 years.</p> <p>Mount St. Helens –The May 18, 1980 eruption covered much of Region 8 in ash, posing temporary but major problems for transportation and for sewage-disposal and water-treatment systems. Due to reduced visibility, many highways and roads closed to traffic. Thick ash accumulation destroyed crops.</p>	<p>Due to prevailing westerly winds, the possibility of an annual ash fall of one centimeter in Region 8 from any major Cascade volcano ranges from 1 in 500 to 1 in 10,000, depending on location.</p> <p>A large lahar in the White Salmon drainage could bury the Trout Lake lowland, enter the Columbia River, and inundate both the Oregon and Washington shorelines for a considerable distance. A large lahar in the Klickitat valley could affect the Columbia River, Bonneville Reservoir, and Bonneville Dam in a similar manner.</p> <p>Lahars large enough to reach the Trout Lake lowland have annual probabilities of about 1 in 100 to 1 in 1,000. A lahar the size of the Trout Lake lahar has an annual probability of about 1 in 1,000 to 1 in 10,000, whereas a lahar of sufficient magnitude to inundate the length of one or more valleys has an annual probability less than 1 in 10,000.</p>

Region 8

Hazard: Volcano **At Risk Population:** Unknown of 488,744 **PRELIMINARY ASSESSMENT**

State Agency Structures At Risk Number and Function of Buildings	No. of Affected Staff / Visitors / Residents	Approx. Value of Owned Structures	Approx. Value of Contents All Buildings
<u>Total at-risk buildings:</u> State Agencies identified – 37 (19 owned, 18 leased)	1,761	\$39,400,317	\$37,450,860

Function of at-risk buildings: Included in the state facilities potentially at risk to lahar or ash fall from volcanic eruption are:

- Campus of Yakima Valley School for mentally and physically disabled adults.
- Washington State Patrol's district headquarters in Yakima
- About 24 general office and client services facilities serving individuals and families on public assistance, providing employment and training services, driver licensing, and liquor sales.

Six state highways are potentially at risk to volcanic eruptions that produce ash fall or lahars in river valleys through which the highways traverse or they cross:

- | | | |
|---------------------|--------------------|--------------------|
| 1. Interstate 82 | 2. U.S. Highway 12 | 3. U.S. Highway 97 |
| 4. U.S. Highway 395 | 5. State Route 14 | 6. State Route 17 |

<u>Total at-risk critical facilities:</u> State Agencies identified – 15 (owned-leased split not available)	481	\$30,283,675	\$36,718,093
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Function of at-risk critical facilities: Included are buildings on the campus of the Yakima Valley School for mentally and physically disabled adults and general office and client services offices.

Six state highways considered emphasis corridors because of their importance to movement of people and freight are potentially at risk to volcanic eruptions that produce ash fall or lahars in river valleys through which the highways traverse or they cross:

- | | | |
|---------------------|--------------------|--------------------|
| 1. Interstate 82 | 2. U.S. Highway 12 | 3. U.S. Highway 97 |
| 4. U.S. Highway 395 | 5. State Route 14 | 6. State Route 17 |

Region 8

Hazard: Wildland Fire

Characteristics	Principal Sources	Event History	Probability
<p>Wildland fires are fires caused by nature or humans that result in the uncontrolled destruction of forests, brush, field crops, grasslands, and real and personal property in non-urban areas.</p> <p>A fire needs three elements in the right combination to start and grow – a heat source, fuel, and oxygen. How a fire behaves primarily depends on the characteristics of available fuel, weather conditions, and terrain.</p> <p>The wildland fire season in Washington usually begins in early July and typically culminates in late September with a moisture event. Drought, snow pack, and local weather conditions can expand the length of the fire season.</p>	<ol style="list-style-type: none"> 1. Humans – people start most wildland fires; from 1992 to 2001, people, on average, caused more than 500 wildland fires each year on state-protected lands. Human-caused fires burn an average of 4,404 state-protected acres each year. 2. Lightning – lightning on average started 135 wildland fires annually on state-protected lands during 1992-2001. Lightning-caused fires burn more state-protected acreage than any other cause, an average of 10,866 acres annually. 	<p>Some of the state's most significant wildland fires occurred in this region:</p> <p>1992 – The Skookum fire burned 51,000 acres in Klickitat County, threatening the city of Goldendale.</p> <p>1996 – The Cold Creek fire burned 57,000 acres in Benton and Yakima Counties.</p> <p>1998 – The Cleveland fire burned 18,500 acres in Klickitat County, destroying 11 homes and 143 cattle.</p> <p>2000 – The 24 Command fire burned 192,000 acres in Benton County. Thirty-six structures lost. The fire burned across three radioactive waste disposal sites on the Hanford Site; no radiation released.</p> <p>2000 – The Mule Dry fire burned 76,800 acres on the Yakama Indian Reservation, and in Benton, Klickitat and Yakima Counties, destroying one home.</p> <p>2000 – Three fires (Alderdale, Goodnoe, and Wood Gulch) on state-protected land burned more than 13,000 acres in Klickitat County.</p>	<p>Nearly all of the state's significant wildland fires have occurred in Eastern Washington.</p> <p>Eastern Washington is more prone to catastrophic wildland fires than Western Washington – the east has both lighter fuels that burn more easily and more snags and hazard trees, and weather conditions more favorable to fire (thunderstorms with dry lightning are more prevalent in the east).</p> <p>Also, the east has a longer fire season than the western half of the state – the west receives more rainfall, has wetter and cooler spring seasons, and is more urbanized.</p>

Region 8

Hazard: Wildland Fire

At Risk Population: Unknown of 488,744

PRELIMINARY ASSESSMENT

State Agency Structures At Risk Number and Function of Buildings	No. of Affected Staff / Visitors / Residents	Approx. Value of Owned Structures	Approx. Value of Contents All Buildings
<u>Total at-risk buildings:</u> State Agency identified – 72 (35 owned, 37 leased)	1,650	\$41,571,655	\$38,219,123
<u>Function of at-risk buildings:</u> Included in the state facilities potentially at wildland fire are:			
<ul style="list-style-type: none"> • Campus of Yakima Valley School for mentally and physically disabled adults. • Local detachments, highway weigh scales, crime lab, and communication facilities of the Washington State Patrol. • About 25 general office and client services facilities serving individuals and families on public assistance, providing employment and training services, driver licensing, and liquor sales. 			
<u>Total at-risk critical facilities:</u> State Agency identified – 42 (owned-leased split not available)	883	\$31,846,810	\$33,979,520
<u>Function of at-risk critical facilities:</u> Included in the state facilities potentially at wildland fire are buildings on the campus of Yakima Valley School for mentally and physically disabled adults; facilities of the Washington State Patrol; and general office and client services facilities.			

Region 8

¹ *Tri-Cities Profile*, Washington Department of Employment Security, Labor Market and Economic Analysis Branch, April 2001.

² *Ibid.*

³ *Klickitat County Profile*, Washington Department of Employment Security, Labor Market and Economic Analysis Branch, June 2002.

⁴ *Walla Walla County Profile*, Washington Department of Employment Security, Labor Market and Economic Analysis Branch, October 2000.

⁵ *Yakima County Profile*, Washington Department of Employment Security, Labor Market and Economic Analysis Branch, December 2002.

⁶ *Profile of Selected Economic Characteristics: Census 2000*, U.S. Census Bureau.

⁷ *Summary of Public Transportation 2001*, Washington State Department of Transportation, November 2002 (Revised April 2003).